

Notes on the cremaster of certain Ruralid pupæ (with two plates).

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(1) *RURALIS BETULÆ* (Portion of the cremastral area $\times 100$). Pl. viii., fig. 1.—In this and other similar preparations, there is an irregular fracture due to forcing the pupal skin to a flat surface, to enable it to be easily examined and to be photographed. In this case, less than half the area is broken away. The greater part of the photograph is of the dorsal portion of the 10th abdominal segment, with a pale (less chitinised) band, and a darker terminal portion, on both these the cremastral hooks (?), reduced to very short blunt hairs, are seen. The plate is not quite clear enough to demonstrate it, but it may be seen that they originate at the intersections of the fine ribbings of the skin sculpture. There is a large lenticle in the middle of the dark area, and one also in the pale area (to left of lower part of dark area). There are also two on the ventral area (to right). These are all repeated on the opposite side of the specimen, but are not symmetrical, *i.e.*, they are *near* the same place on the other side, so near as to appear to correspond, but are sufficiently distant to make it possible they do not. Down to the right, *i.e.*, above or dorsal to the pale band, fine skin-spiculæ come out well in the plate, as well as the ribbing of the skin-sculpture and the points they carry.

(2) *CALLOPHRYS RUBI* (Portion of cremastral area $\times 100$). Pl. vii., fig. 2.—We have, here, both sides of a fracture running through a portion of the cremastral region. This photograph, and the plate reproduces it fairly satisfactorily, illustrates at least three very remarkable points, that give this structure so much interest in the pupa of *Callophrys rubi*. In the first place, no one has noted that this pupa ever takes any attachment by its cremaster, I have never seen any indication of anything of the sort, and I have handled a good many pupæ of the species, yet the pupa possesses a good many very well-developed anchor-hooks of the pattern usual in the Theclid group, and, one would say, obviously quite capable of functional use. The two other points, however, afford support to the view that the cremaster is not used, and has reverted to more simple conditions, except, most extraordinarily, in the structure of the hooks themselves. The first of these items is that the hooks are, more plainly than in any other species I have examined, developments from the points that exist at the crossing of the skin reticulations, and have, therefore, no direct relationship with the ordinary hairs; with *C. rubi* before us to suggest the enquiry, one may note a similar condition in other species, but not pointedly enough to call attention to the structural fact. The other item is equally an illustration that the cremastral area is reverting to ordinary skin conditions; this is the occurrence amongst the anchor-hooks of the cremaster, of ordinary hairs, as usual, unattached to the reticular ribs. I do not know any pupa that has ordinary hairs mixed with the hooks of a functional cremaster, however closely they may approach it. It is to be observed, that the hairs are so much longer than the hooks that they would probably much embarrass, if not prevent, their proper functions, if its exercise was desired.

(3) *STRYMON PRUNI* (Portion of the cremastral area $\times 100$). Pl. vii., fig. 1.—Like the others figured a fractured portion, which fails

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